

REMARKS

This Response is intended as a complete response to the Office Action dated February 7, 2006. In view of the following discussion, the Applicants submit that all claims are presently in condition for allowance.

RESTRICTION ELECTION

The Applicants confirm the provisional election made via teleconference with the Examiner on 1/27/06. Specifically, the Applicants have withdrawn claims 22-27 from prosecution.

CLAIM AMENDMENTS

Claims 9-10, 17, 43-44, and 51 have been amended to correct typographical errors. Specifically, claims 9-10 and 43-44 have been amended to correct the phrase “at least one ex-situ measuring tool.” In addition, claims 17 and 51 have been amended to correct the spelling of the terms “remote” and “performed.” The Applicants submit that these amendments were made for reasons unrelated to patentability, that no new matter has been added, and that the scope of these claims has not been changed by these amendments.

Additionally, in view of amendments made to independent claim 1, the Applicants have amended claim 17 to depend from newly added claim 53, as discussed more fully below.

CLAIM REJECTIONS

35 USC §112

Claims 11 and 45 stand rejected under 35 USC §112 due to lack of antecedent basis for the term “the processing equipment” and “the processing system.” In response, the Applicants have amended claims 11 and 45 to more clearly recite aspects of the invention.

Thus, the Applicants submit that claims 11 and 45 are in proper form. Accordingly, the Applicants respectfully request that the rejection be withdrawn and the claims allowed.

35 USC §102

Claims 1 and 28-35 stand rejected under 35 USC §102(e) as being anticipated by US Patent Ser. No. 6,625,497, issued September 23, 2003, to *Fairbairn, et al.* (hereinafter *Fairbairn*). The Applicants have cancelled claims 28-35, without prejudice. The Applicants reserve the right to file continuing and/or divisional applications to prosecute the unclaimed subject matter. Accordingly, the rejection is moot with respect to these claims. In addition, the Applicants have amended claim 1 to more clearly recite aspects of the invention.

With respect to 35 USC §102, or “anticipation,” the Federal Circuit has repeatedly stated that “there is no anticipation unless all of the same elements are found in exactly the same situation and united in the same way . . . in a single prior art reference.” *Perkin-Elmer Corp. v. Computervision Corp.*, 732 F.2d 888, 894 (Fed. Cir., 1984); *Kalman v. Kimberly-Clark Corp.*, 713 F.2d 760, 771, 218 U.S.P.Q. (BNA) 781, 789 (Fed. Cir. 1983). Here, *Fairbairn* fails to identify each of the claimed elements as arranged in independent claim 1, as amended, so as to establish a *prima facie* case of anticipation.

Fairbairn teaches a semiconductor processing module with integrated feedback/feed forward metrology. Specifically, *Fairbairn* teaches reducing critical dimension (CD) variation by feeding back information gathered during inspection of a wafer (e.g., after photoresist development) to upcoming lots that will be going through the photolithography process, and by feeding forward information to adjust the next process the inspected wafer will undergo (e.g., the etch process). (*Fairbairn*, col. 4, ll. 40-46.) *Fairbairn* further teaches taking post-etch CD measurements and optionally reviewing the wafer if a significant variation from normal post-etch data is observed. (*Id.*, col. 12, ll. 24-34; col. 13, ll. 55-65.)

However, *Fairbairn* fails to teach or suggest adjusting a process recipe of an etch process for etching the substrate and a process recipe of at least one post-etch process using the results of measuring the dimensions on the structures, as recited in claim 1. Therefore, *Fairbairn* fails to identify each of the claimed elements as arranged in independent claim 1 so as to establish a *prima facie* case of anticipation.

Thus, the Applicants submit that independent claim 1 is patentable over *Fairbairn*. Accordingly, the Applicants respectfully request that the rejection be withdrawn and the claim allowed.

35 USC §103

A. Claims 2-5 and 8-17

Claims 2-5 and 8-17 stand rejected under 35 USC §103 as being unpatentable over *Fairbairn* in view of US Patent 6,567,717, issued May 20, 2003, to *Krivokapic, et al.* (hereinafter *Krivokapic*). In view of the amendment to claim 1, from which the rejected claims depend, the Applicants respectfully disagree.

Independent claim 1, from which claims 2-5 and 18-17 depend, recites limitations not taught or suggested by any permissible combination of the cited art. The patentability of claim 1 over *Fairbairn* is discussed above. The Examiner cites *Krivokapic* to assert that it would have been obvious to use the teachings of *Krivokapic* to modify the teachings of *Fairbairn* to yield the limitations recited in the rejected claims. However, *Krivokapic* fails to teach or suggest adjusting a process recipe of an etch process for etching the substrate and a process recipe of at least one post-etch process using the results of measuring the dimensions on the structures, as recited in claim 1. Hence, *Krivokapic* fails to teach or suggest a modification to the teachings of *Fairbairn* that would yield the limitations recited in claim 1. Therefore, a *prima facie* case of obviousness has not been established as the combination of the cited references fails to yield the limitations recited in the claims.

In addition, with respect to claim 2, the Examiner states that *Krivokapic* teaches that wafers may be returned for further etching if under-etched. However, *Krivokapic* merely teaches and suggests further etching of an under-etched workpiece and not a multi-pass process wherein the substrate is processed more than once by an etch process and at least one post-etch process while forming the at least one structure, as recited in claim 2. Therefore, a *prima facie* case of obviousness has further not been established with respect to claim 2 because the combination of the cited references fails to yield the limitations recited in the claim.

Thus, the Applicants submit that independent claim 1, and claims 2-5 and 8-17 depending therefrom, are patentable over *Fairbairn* in view of *Krivokapic*. Accordingly, the Applicants respectfully request that the rejection be withdrawn and the claims allowed.

B. Claims 6, 7, and 18

Claims 6, 7, and 18 stand rejected under 35 U.S.C. §103 as being unpatentable over *Fairbairn* in view of US Patent Application No. 2004/0087041 published May 6, 2004 to *Perry, et al.* (hereinafter *Perry*). In view of the amendment to claim 1, from which the rejected claims depend, the Applicants respectfully disagree.

Independent claim 1, from which claims 6, 7, and 18 depend, recites limitations not taught or suggested by any permissible combination of the cited art. The patentability of claim 1 over *Fairbairn* is discussed above. *Perry* discloses a method of controlling a recess etch process. Specifically, *Perry* teaches determining the absolute vertical dimension of a column of material to be etched in a substrate (i.e., a trench) and using single- or multi-wavelength interferometry to monitor the actual etching of the recess. (*Perry*, ¶[0039].) However, *Perry* fails to teach or suggest adjusting a process recipe of an etch process for etching the substrate and a process recipe of at least one post-etch process using the results of measuring the dimensions on the structures, as recited in claim 1. Hence, *Perry* fails to teach or suggest a modification of *Fairbairn* that would yield the limitations recited in claim 1. Therefore, a *prima facie* case of obviousness has not been established as the combination of the cited references fails to yield the limitations recited in the claims.

Thus, the Applicants submit that claims 6, 7, and 18 are patentable over *Fairbairn* in view of *Perry*. Accordingly, the Applicants respectfully request that the rejection be withdrawn and the claims allowed.

C. Claims 19-21

Claims 19-21 stand rejected under 35 U.S.C. §103 as being unpatentable over *Fairbairn* in view of US Patent Application No. 2003/0022510 published January 30,

2003 to *Morgenstern* (hereinafter *Morgenstern*). In view of the amendment to claim 1, from which the rejected claims depend, the Applicants respectfully disagree.

Independent claim 1, from which claims 19-21 depend, recites limitations not taught or suggested by any permissible combination of the cited art. The patentability of claim 1 over *Fairbairn* is discussed above. The Examiner cites *Morgenstern* to show a process of forming a capacitive trench structure with a polysilicon electrode layer wherein the etch process is performed with an HBr and Cl₂ chemistry. (*Office Action*, p. 11, ll. 3-6.) However, *Morgenstern* fails to teach or suggest adjusting a process recipe of an etch process for etching the substrate and a process recipe of at least one post-etch process using the results of measuring the dimensions on the structures, as recited in claim 1. Hence, *Morgenstern* fails to teach or suggest a modification of *Fairbairn* that would yield the limitations recited in claim 1. Therefore, a *prima facie* case of obviousness has not been established as the combination of the cited references fails to yield the limitations recited in the claims.

Thus, the Applicants submit that claims 19-21 are patentable over *Fairbairn* in view of *Morgenstern*. Accordingly, the Applicants respectfully request that the rejection be withdrawn and the claims allowed.

D. Claims 36-52

Claims 36-52 stand rejected under 35 USC §103 as being unpatentable over *Fairbairn* in view of *Krivokapic* and further in view of *Perry*. The Applicants respectfully disagree.

Independent claim 36 recites limitations not taught or suggested by any permissible combination of the cited art. The Examiner admits that *Fairbairn* is silent with respect to a multi-pass process and asserts that the re-work of under etched wafers as taught by *Krivokapic* “in effect describes a multi-pass process.” (*Office Action*, p. 11, ll. 19-22.) However, as noted above with respect to claim 2, although *Krivokapic* teaches further etching of an under-etched workpiece, such re-work is not a multi-pass process as defined by the claims. Specifically, *Krivokapic* fails to teach or suggest executing a multi-pass process, wherein the substrate is processed more than once by an etch process and at least one pre-etch process and/or at least one post-etch

process while forming at least one structure on the substrate, where each time the substrate is processed by the etch process is a pass, as recited in claim 36. Also, as discussed in section B., above, *Perry* similarly fails to teach or suggest a multi-pass process as recited in claim 36. Accordingly, *Krivokapic* and *Perry* fail to teach or suggest a modification to the teachings of *Fairbairn* that yields the limitations recited in claim 36. Therefore, a *prima facie* case of obviousness has not been established because the combination of the cited references fails to yield the limitations recited in the claim.

Thus, the Applicants submit that independent claim 36, and claims 37-52 depending therefrom, are patentable over *Fairbairn* in view of *Krivokapic* and further in view of *Perry*. Accordingly, the Applicants respectfully request that the rejection be withdrawn and the claims allowed.

NEW CLAIM

New claim 53 has been added to the application. The Applicants submit that this claim is supported by the specification and that no new matter has been added. Claim 53 depends from claim 1 and is allowable at least for the reasons discussed above. As noted above, claim 17 has been amended to depend from claim 53. The Applicants submit that 17 is also allowable over the cited art at least for the reasons discussed above. Accordingly, the Applicants respectfully request that the claim be entered into the application and allowed.

CONCLUSION

Thus, the Applicants submit that all claims now pending are in condition for allowance. Accordingly, both reconsideration of this application and its swift passage to issuance are earnestly solicited.

If the Examiner believes that there are any unresolved issues, it is requested that the Examiner telephone Mr. Alan Taboada at (732) 935-7100 so that appropriate arrangements can be made for resolving such issues as expeditiously as possible.

Respectfully submitted,

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Date

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